

**BEFORE THE  
PUBLIC SERVICE COMMISSION OF  
SOUTH CAROLINA**

**DOCKET NO. 2019-224-E  
DOCKET NO. 2019-225-E**

In the Matter of:

South Carolina Energy Freedom Act (House  
Bill 3659) Proceeding Related to S.C. Code  
Ann. Section 58-37-40 and Integrated  
Resource Plans for Duke Energy Carolinas,  
LLC and Duke Energy Progress, LLC

**REBUTTAL TESTIMONY OF  
DAWN A. SANTOIANNI  
ON BEHALF OF DUKE ENERGY  
CAROLINAS, LLC AND DUKE  
ENERGY PROGRESS, LLC**

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**I. INTRODUCTION AND PURPOSE**

**Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

A. My name is Dawn A. Santoianni. My business address is 411 Fayetteville Street, Raleigh North Carolina.

**Q. BY WHOM ARE YOU EMPLOYED AND IN WHAT CAPACITY?**

A. I am currently employed by Duke Energy Carolinas, LLC as State Energy Policy Director for North Carolina.

**Q. DID YOU PREVIOUSLY FILE DIRECT TESTIMONY IN THIS PROCEEDING?**

A. Yes.

**Q. WHAT IS THE PURPOSE OF YOUR REBUTTAL TESTIMONY IN THIS PROCEEDING?**

A. The purpose of my rebuttal testimony is to address several issues discussed in the direct testimony of Vote Solar and Carolinas Clean Energy Business Association<sup>1</sup> (“CCEBA”) witnesses, namely (1) asking the Public Service Commission of South Carolina (the “Commission”) to mandate that additional climate risks be considered in the Companies’ Integrated Resource Plans (“IRPs”); (2) making unsubstantiated and flawed arguments that natural gas plants will lead to stranded costs, and (3) asking the Commission to go beyond the scope of these proceedings and what I understand to be the Commission’s authority in arguing that the Companies should study RTOs and other market constructs in the IRP process. Specifically, I will rebut these issues as raised in the testimonies of Vote Solar

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<sup>1</sup> The CCEBA testimony to which I am responding was filed originally by the South Carolina Solar Business Alliance, Inc. (“SCSBA”). On March 10, 2021, the Commission issued Order No. 2021-167 and granted a Motion to substitute CCEBA for SCSBA as party of record in these dockets.

1 Witness Tyler Fitch and CCEBA Witness Kevin Lucas related to the Companies' 2020  
2 IRPs.

3 **Q. PLEASE SUMMARIZE YOUR REBUTTAL TESTIMONY.**

4 A. First, Witness Fitch's claim that the IRPs should study and incorporate climate risk is  
5 overly broad and inappropriate, conflating concepts such as physical mitigation and  
6 reputation risks, both of which are well outside the scope of the IRP process, with resource  
7 planning to meet customer demand.<sup>2</sup> Witness Fitch asserts that the Companies' carbon  
8 price scenario and portfolios, which meet the North Carolina Clean Energy Plan goals, are  
9 insufficient to address future climate risks.<sup>3</sup> In so arguing, he sets out a path that I believe  
10 the Commission should not pursue. Witness Fitch misconstrues the role of state and federal  
11 policymakers with the Companies' regulatory obligations. The Companies are not  
12 policymakers and while our management may set aspirational climate goals, we do not and  
13 cannot set climate policy. By asking for the Companies to study policies to achieve net  
14 zero by 2050 within the IRPs, Witness Fitch essentially asks the Commission to issue a  
15 mandate that sets a climate policy and brings climate policy studies into the scope of the  
16 IRPs. He asks this Commission to do this based upon a study he conducted, which has not  
17 been peer reviewed, and that is based on incorrect assumptions and riddled with flaws, as  
18 described in the rebuttal testimony of DEC/DEP Witnesses Snider and Roberts. I  
19 understand Witness Fitch's passion for climate policy, but as someone who has been  
20 working in the policy and regulatory arena for 22 years, I know that it is important to  
21 remember that state and federal legislators determine such policies. Moreover, any policy

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<sup>2</sup> Vote Solar Fitch Direct, at 7-27.

<sup>3</sup> Vote Solar Fitch Direct, at 46-50.

1 that would require carbon emissions reductions would be based on much broader statewide  
2 or national studies from more established scientific entities and involve robust public  
3 debate and opportunity for comment. Once enacted by policymakers, the Companies  
4 would incorporate the legal and regulatory requirements generated by climate studies into  
5 future IRPs within the purview of this Commission.

6 Duke Energy publishes a climate report based on the reporting framework from the  
7 Task Force on Climate-Related Financial Disclosures (“TCFD”), which is considered the  
8 standard for climate disclosures. The climate report is published outside of the IRP  
9 process, and details numerous actions that Duke Energy takes to address physical,  
10 financial, economic, regulatory and reputational risks – the very same risk categories and  
11 framework that Witness Fitch believes should be addressed within the IRP process.<sup>4</sup> Duke  
12 Energy first published a climate report using this framework in 2018, and again in 2020,  
13 and will update the report in the future as appropriate. Witness Fitch specifically  
14 acknowledges that the TCFD framework in Duke Energy’s climate report provides “an  
15 accessible template” for climate-related risk information.<sup>5</sup> That admission by Witness  
16 Fitch undercuts his contention that more climate analysis should be ordered as part of the  
17 IRP process.

18 Further, the type of climate risk analysis that Witness Fitch is asking the  
19 Commission to mandate in the IRPs is wholly redundant with a study that is the product of  
20 a settlement agreement entered into between Vote Solar and the Companies in North  
21 Carolina. As part of that settlement, the Companies have agreed to undertake a climate

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<sup>4</sup> Vote Solar Fitch Direct, at 97.

<sup>5</sup> Vote Solar Fitch Direct, at 25.

1       resiliency study in a rate case docket before the North Carolina Utilities Commission  
2       (“NCUC”). Witness Fitch appears to be trying to re-trade a deal he already struck.  
3       Importantly, that climate resiliency study already agreed upon is not part of an IRP  
4       proceeding, and the assessment will encompass the information that Witness Fitch requests  
5       in his testimony. The study can be used to inform federal and state policymakers who will  
6       ultimately make decisions about what to require of utilities. I want to stress that that the  
7       Companies are willing and have committed to conduct such a study—my testimony should  
8       not be interpreted as questioning that commitment. However, it would be inappropriate to  
9       capture the analysis and results of such a study within the silo of the IRP process, as  
10      recommended by Witness Fitch, when it should be part of a much larger conversation about  
11      climate resiliency. As explained more fully by DEC/DEP Witnesses Snider and Roberts,  
12      the Companies believe, for practicality and for costs’ sake, that the IRPs should not become  
13      an open-ended process that is “all things to all people.” The IRPs are planning documents  
14      rooted in the Companies’ plans to meet load and operate reliably and efficiently under  
15      today’s legal and regulatory requirements. To overwhelm the IRP process with perpetual  
16      “what if” possibilities would obscure this fundamental purpose, creating ever-moving goal  
17      posts and unnecessarily increasing costs for customers.

18           Second, Witness Fitch’s analysis that the IRPs will result in stranded costs for  
19      customers is misleading, biased and inaccurate.<sup>6</sup> First and foremost, the IRPs include  
20      useful lives for natural gas assets based upon the life cycle appropriate for use in today’s  
21      planning. Those life spans may be shorter than what is currently in depreciation schedules  
22      for in-service gas plants, but future natural gas generation is nonetheless viable, even with

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<sup>6</sup> Vote Solar Fitch Direct, at 47, 71-77.

1 climate policy, and are economic for meeting customer demand. Witness Fitch—who I  
2 believe may have a bias against natural gas generation—further makes arguments against  
3 natural gas generation based on unrealistic assumptions for future operations of the  
4 Companies’ systems and overlooks DEC’s and DEP’s unique regulatory and statutory  
5 obligations to maintain the reliability of their systems. Witness Fitch criticizes the  
6 Companies for not making crystal ball assumptions about policies and technologies 30  
7 years into the future, while incorrectly assuming that federal or state carbon policies will  
8 cause natural gas assets to be stranded. His analysis is inconsistent with reputable studies  
9 showing the role of natural gas capacity in the long-term transition to net zero emissions.

10 Third, with regard to the request from Vote Solar and CCEBA that alternate  
11 wholesale market structures be studied within the context of the IRPs, Witness Fitch and  
12 CCEBA Witness Lucas are inappropriately asking this Commission to encroach upon the  
13 authority of the South Carolina General Assembly.<sup>7</sup> Any study of new wholesale market  
14 structures should be conducted pursuant to the legislatively-approved process in South  
15 Carolina and within the framework intended by legislators. Moreover, this Commission  
16 alone cannot mandate such actions, as I understand it. Given the multi-state operations of  
17 DEC and DEP, any resulting action would require the assent of North Carolina legislators  
18 as well.

## 19 II. RESPONSE TO WITNESS FITCH

20 **Q. WHAT IS YOUR OVERALL IMPRESSION OF WITNESS FITCH’S**  
21 **TESTIMONY?**

22 **A.** I do not believe that Witness Fitch’s testimony is relevant to these proceedings for several

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<sup>7</sup> Vote Solar Fitch Direct, at 59-60; CCEBA Lucas Direct, at 109-110.

1 reasons and should be rejected by this Commission, or at best, given very little weight.  
2 Despite his arguments, the Commission should not order a climate study in the IRP process  
3 in the absence of enacted federal or state policy,<sup>8</sup> nor should the Commission accept an  
4 inflammatory and illogical view such as that proposed by Witness Fitch that would seek to  
5 eliminate natural gas generation as a future option for customers—which could be a risky  
6 approach when you look at the needs of the Companies’ systems, as explained by  
7 Witnesses Snider and Roberts. The Companies have detailed in the IRPs that relying on  
8 the no new gas scenario is dependent on the uncertain development and commercial  
9 maturity of dispatchable, zero-emitting technologies.

10 First, Witness Fitch misunderstands the purpose of the IRPs, implying that the  
11 Companies’ 15-year IRPs should morph into a climate risk assessment, rather than their  
12 regulatory purpose to serve as a long-range plan to maintain system reliability for  
13 customers over the next 15 years. The IRPs must balance resource adequacy and capacity  
14 to serve anticipated peak electrical load with affordability and compliance with applicable  
15 state and federal environmental regulations. Witness Fitch confuses the roles of regulated  
16 utilities, legislators and environmental regulators by asserting that the Companies should  
17 assess additional carbon pricing scenarios to address the social costs of climate change in  
18 the IRPs.

19 Second, Witness Fitch’s testimony relies on a simplistic analysis based on incorrect  
20 assumptions in his assessment of the potential for stranded costs, leading to inaccurate and  
21 unrealistic conclusions. Third, Witness Fitch implies that because the IRPs only forecast  
22 the Companies’ resource plans over the next 15 years, the resource plans are somehow

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<sup>8</sup> Vote Solar Fitch Direct, at 46, 98, 100.

1 inconsistent with Duke Energy's 2050 climate goal. Witness Fitch ignores that all of the  
2 portfolios in the IRPs place the Companies on a trajectory for reaching net zero emissions  
3 by 2050. His testimony suggests the time horizon for the IRPs to be 30 years, rather than  
4 15 years—which is the time frame mentioned in the South Carolina IRP statute, and which  
5 I believe to be industry standard. It is not appropriate for the IRPs to speculate what  
6 policies may look like in 2050. It is outside the timeframe of the plan, and any  
7 consideration of costs or available technologies would be highly speculative and subject to  
8 significant uncertainty. Duke Energy's climate report specifically addresses these  
9 uncertainties and that getting to net zero emissions by 2050 would require new  
10 dispatchable, zero carbon technologies that are not available today. Requiring the IRPs to  
11 look out through 2050 could grossly increase the cost and complexities of the IRP  
12 process—ultimately paid for by customers—with no real benefit, particularly given that  
13 the Companies file comprehensive IRPs every other year.

14 **Q. WHY DO YOU DISAGREE WITH VOTE SOLAR'S ARGUMENT TO STUDY**  
15 **CLIMATE RISK WITHIN THE CONTEXT OF THE IRPs?**

16 A. The testimony of Witness Fitch patently misconstrues the purpose of the IRP process and  
17 attempts to place the burden of policy setting on the Companies. The IRP process lays out  
18 how the Companies will safely and reliably serve customers over a 15-year period. The  
19 IRPs are updated annually, as technologies evolve, fuel and technology costs change, load  
20 forecasts adjust, new laws are enacted, and regulations are promulgated. The IRPs  
21 represent a snapshot in time, versus a vehicle to get the Commission to set and codify  
22 climate policy.



1 In addition to regulation by this Commission and the NCUC, the Companies are  
2 subject to extensive regulations by the Federal Energy Regulatory Commission and state  
3 and federal environmental agencies. State environmental agencies and the U.S.  
4 Environmental Protection Agency (“USEPA”) are charged with and responsible for setting  
5 regulations to protect human health and the environment, informed by rigorous science and  
6 studies, including potential regulations on carbon emissions. The Companies’  
7 responsibility is to provide safe, reliable and affordable energy to its customers and comply  
8 with and to follow the suite of health and safety regulations that are established by state  
9 and federal regulators. Importantly, state and federal legislation and regulation drive the  
10 incorporation of environmental attributes and risk into the cost of any particular resource.  
11 For example, at the federal level, regulations pursuant to the Clean Air Act, Clean Water  
12 Act, and Resource Conservation and Recovery Act have increased the operating costs for  
13 coal generating units. The Companies’ responsibilities are to account for the costs  
14 associated with state and federal laws and promulgated regulations into the IRPs.

15 **Q. DO THE COMPANIES’ IRPs IGNORE CLIMATE RISK?**

16 A. No they do not. Witness Fitch ignores the fact that carbon sensitivities provide reasonable  
17 planning assumptions on this topic. Importantly, the carbon sensitivities included in the  
18 Companies’ 2020 IRPs adequately recognize the potential for shifting legal and regulatory  
19 requirements around carbon policy and climate change. However, because the Companies  
20 cannot set policy, the carbon pricing in the IRPs are used as a proxy for future policies, in  
21 order to understand how resource planning may respond to future regulatory changes. It is  
22 neither appropriate nor a prudent use of resources – and customers’ dollars – to conduct an  
23 analysis of carbon prices and how that may affect climate risk in the future.

1           Witness Fitch points to the North Carolina Clean Energy Plan contemplating future  
2 policies to decarbonize the power sector as an example of regulatory risk.<sup>9</sup> By focusing  
3 his testimony on only one out of the six portfolios presented by the Companies (Base Case  
4 with Carbon Policy), Witness Fitch disregards the portfolios that address policy risk in  
5 North Carolina, particularly the Earliest Practicable Coal Retirements portfolio and the two  
6 70% carbon reduction portfolios, which are consistent with the NC Clean Energy Plan  
7 goals. Witness Fitch's criticism of the Companies' carbon sensitivities<sup>10</sup> as not reflective  
8 of policy risk is contradicted by the NC Clean Energy Plan modeling, which showed that  
9 the carbon sensitivities used in the Companies' IRPs actually escalate faster and rise to  
10 higher prices than other carbon prices studied.<sup>11</sup> For these reasons, it is perplexing that  
11 Witness Fitch would criticize the Companies' carbon prices in the IRPs as somehow not  
12 representing climate policy risk.

13 **Q.    WOULD THE COMPANIES EVEN HAVE APPROPRIATE INFORMATION TO**  
14 **DO THE TYPE OF IRP ANALYSIS ADVOCATED FOR BY VOTE SOLAR?**

15 A.    No—the federal government needs to speak to how and what the electric power sector and  
16 utilities need to do in this regard. As with any legislative or regulatory mandate, specifics  
17 are important and could significantly affect resource planning. For example, if a federal  
18 carbon price was enacted, the cost per ton of carbon dioxide, and whether that pricing  
19 extends to all sectors including transportation could dramatically affect electrification of  
20 other sectors and resulting load forecasts. If a national clean energy standard was

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<sup>9</sup> Vote Solar Fitch Direct, Exhibit TF-2, at 21-22.

<sup>10</sup> Vote Solar Fitch Direct, at 44-45.

<sup>11</sup> Konschnik, K., M. Ross, J. Monast, J. Weiss, and G. Wilson. Power Sector Carbon Reduction: An Evaluation of Policies for North Carolina. NI R 21-01. Duke University, Durham, NC, March 10, 2021. See Figure 5.1.

1 promulgated and natural gas receives partial credit, as has been included in recently  
2 proposed legislation,<sup>12</sup> that would affect the most economic resource mix for compliance,  
3 further supporting the role of natural gas for maintaining reliability. Transmission  
4 permitting, alternative compliance mechanisms, banking and borrowing of credits and  
5 planning reserve requirements are just a few other policy provisions that could affect future  
6 resource planning. I would also note that carbon policy has been under consideration by  
7 Congress for over a decade. As policies evolve and are finally enacted, whether through  
8 legislation that is signed into law or regulations that are promulgated, the Companies would  
9 reflect those changes in future IRPs and financial disclosures.

10 **Q. ARE ANY OF THE COMPANIES' ACTIONS OUTSIDE THE IRP PROCESS**  
11 **INFORMED BY CLIMATE RISK?**

12 A. Yes, and Witness Fitch essentially ignores that work. There are other climate risk  
13 mitigation measures that are outside the scope of an IRP, including physical hardening,  
14 adaptive grid technologies, water conservation and equipment upgrades – which is why  
15 Duke Energy publishes a Climate Report. The Companies already have work underway  
16 for grid improvements which will help address climate risk, and storm planning is a part  
17 of our Companies' lifeblood. As an example of risk mitigation, the Companies are  
18 deploying enhanced barriers at substations to reduce flooding potential and keep these  
19 essential systems operating. Other areas covered by Duke Energy's 2020 Climate Report  
20 include structural hardening and equipment upgrades at nuclear stations, modeling to  
21 identify sites most vulnerable to flooding and natural disaster planning and storm planning

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<sup>12</sup> Climate Leadership and Environmental Action for our Nation's (CLEAN) Future Act, 117<sup>th</sup> Cong. (March 2, 2021).

1 and response. These actions taken by the Companies directly address climate risks to our  
2 system, but are well outside the scope of the IRPs.

3 Witness Fitch's testimony points to the Con Edison Climate Change Vulnerability  
4 Study (Exhibit TF-5) ("Con Ed Study") as an example of the type of analysis Vote Solar  
5 would like this Commission to mandate.<sup>13</sup> However, that study was conducted outside of  
6 an IRP proceeding and encompasses non-IRP related measures. The Con Ed Study  
7 considered numerous adaptation measures including engineering design, upgrades to  
8 physical infrastructure including hardening, grid technologies to reduce outage events and  
9 duration, data collection and monitoring, and emergency preparedness. These are elements  
10 outside of the IRP process and consistent with risk mitigation measures identified in Duke  
11 Energy's Climate Report. In addition to the previously discussed policy and physical risks,  
12 the Climate Report also covers issues that Witness Fitch claims should be considered as  
13 part of the IRP process, including reputational risks and governance. In summation, Vote  
14 Solar is asking for a climate risk assessment that includes elements beyond the scope of an  
15 IRP, ignores activity already embraced by the Companies outside of the IRP process, and  
16 is already addressed in Duke Energy's Climate Report and other disclosures.

17 **Q. IS VOTE SOLAR'S REQUEST FOR A CLIMATE RISK STUDY REDUNDANT?**

18 A. Yes. In addition to the reasons stated above, Vote Solar has entered into a settlement  
19 agreement with the Companies as part of a rate case proceeding before the NCUC (Docket  
20 No. E-7, Sub 1214) to conduct a study assessing impacts of climate change on the  
21 Companies' grid improvement plan and existing grid, including operations, planning and  
22 physical assets. This study would encompass grid hardening and other physical resiliency

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<sup>13</sup> Vote Solar Fitch Direct, at 45-46.

measures and is beyond the scope of the IRP process, similar to what was included in the Con Edison Study. Vote Solar is now asking the Commission to order a redundant study that would unnecessarily add costs for customers and is an attempt to re-trade on a bargain already struck. It is therefore unclear what purpose such a redundant request would serve. Thus, the climate risk study in the NC settlement agreement should satisfy Vote Solar's request in their testimony, and the appropriate scope of the study has been established as well as how it would be used.

**Q. IS WITNESS FITCH'S ANALYSIS OF STRANDED ASSETS CORRECT?**

A. No. Witness Fitch's testimony relies extensively on a report he authored as a "fellow" of the Energy Transition Institute ("ETI") (Exhibit TF-2) that uses unrealistic and inaccurate assumptions to falsely claim that fossil assets will become stranded under future climate policy. It has not been peer-reviewed that I am aware of, and ETI is not an established entity within policy space. The collective work of ETI appears to be two reports that are critical of Duke Energy, including the one report that Witness Fitch authored and referenced throughout his testimony. Both reports by ETI "fellows" appear to have been published to advance the interests of the solar industry.<sup>14</sup> Because of this bias, I do not believe the Commission should give it much, if any, weight.

As an initial observation, there is a concerning lack of modeling rigor coupled with wrong assumptions in Witness Fitch's report. The analysis does not use production cost modeling or otherwise account for reliability and meeting customer load throughout the

<sup>14</sup> Additionally, per ETI's website, both reports list Tyler Norris as a "Contributing Editor." Mr. Norris is employed by solar developer Cypress Creek Renewables and serves or recently served on the Board of Directors for the S.C. Solar Business Alliance. See SCSBA Petition to Intervene at 2, Docket Nos. 2019-224-E & 2019-225-E (June 14, 2019).

1 year. By failing to model hourly electricity load, the ETI report overlooks this critical need.  
2 Notably, the report ignores the basic requirement of the IRPs in planning a system that  
3 serves customer load reliably every hour. It is also my understanding that Witness Fitch's  
4 analysis is plagued with errors in input data and technical assumptions. DEC/DEP Witness  
5 Roberts' rebuttal testimony addresses this aspect more specifically. Unlike the Companies'  
6 IRPs, the ETI report fails to recognize or account for variability in customer demand, fuel  
7 costs, technology costs, or changing dispatch of fleet resources in the future, such as dual-  
8 fuel units. The Companies' IRPs demonstrate the economic viability of gas assets, as they  
9 will continue to be relied upon for meeting customer demand and balancing intermittent  
10 resources.

11 Witness Fitch further claims that the Companies' IRPs are inconsistent with Duke  
12 Energy's climate goals, and that a net zero emissions goal will result in stranded natural  
13 gas assets.<sup>15</sup> Importantly, Duke Energy has specifically analyzed this aspect in its Climate  
14 Report, by assuming a reduced book life for new gas units and examining their economic  
15 value with a net zero target. That analysis showed that gas units still were used and useful  
16 through 2050, continued to provide capacity value and called on to maintain reliability.

17 Witness Fitch also incorrectly assumes that federal or state policy will preclude the  
18 use of natural gas for electricity and these assets will be stranded under carbon policies.<sup>16</sup>  
19 This is inconsistent with the aforementioned federal legislative proposal that would give  
20 partial credit to natural gas under a national clean electricity standard, recognizing the  
21 importance of this resource in reducing emissions.

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<sup>15</sup> Vote Solar Fitch Direct, at 70-76.

<sup>16</sup> Vote Solar Fitch Direct, at 65.

1 **Q. DO YOU BELIEVE WITNESS FITCH MAKES APPROPRIATE ASSUMPTIONS**  
2 **IN REACHING HIS CONCLUSIONS?**

3 A. No. Witness Fitch relies on unrealistic assumptions for future emissions and operation of  
4 fossil units, a simplistic straight-line emissions trajectory and rudimentary decision process  
5 to artificially inflate his calculation of stranded costs. To explain each of these errors, it is  
6 important to understand how Witness Fitch deemed gas assets would be stranded and his  
7 calculation of stranded costs. First, his analysis assumes that coal and natural gas units  
8 will continue to operate through 2050 as they did in in 2016-2018.<sup>17</sup> This is wholly  
9 unrealistic and inconsistent with both the Companies' IRPs and the Duke Energy Climate  
10 Report, which clearly show an evolving role for natural gas units as coal is retired and more  
11 renewable energy and energy storage is added to the system. By 2050, Duke Energy's  
12 Climate Report shows that natural gas units will provide about 6% of generation. Witness  
13 Fitch undermines his own argument here, because his report acknowledges that operating  
14 gas units at low capacity factors (on the order of 5%) "contributes very little to total  
15 emissions."<sup>18</sup> Second, the calculation of carbon emissions using historical capacity factors  
16 inflates the predicted emissions of these units, which is inconsistent with both the  
17 Companies' IRPs and the Climate Report. For example, Witness Fitch assumes the  
18 Companies' emissions in the Carolinas will be above 50 million tons in 2030, and over 30  
19 million tons in 2050. This is entirely inconsistent with detailed modeling in the  
20 Companies' IRPs, showing emissions in 2030 for the Base Case without Carbon Policy at  
21 34.8 million tons for DEC and DEP combined. Under the Base Case with Carbon Policy,

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<sup>17</sup> Vote Solar Fitch Direct, at 68-69.

<sup>18</sup> Vote Solar Fitch Direct, Exhibit TF-2 at 46; Vote Solar Fitch Direct, at 72.

1 emissions are predicted to be 31.8 million tons by 2030 for DEC and DEP combined. This  
2 is close to what Witness Fitch claims for emissions all the way out in 2050. His analysis  
3 also does not consider dual-fuel capability or the potential for hydrogen blending for  
4 reducing emissions. Although the IRPs did not model the system out to 2050, Duke  
5 Energy's Climate Report shows enterprise-wide emissions (including Carolinas, Florida  
6 and Midwest) at approximately 7 million tons in 2050, or about one-fifth of the emissions  
7 that Witness Fitch based his calculations on.

8 After assuming emissions associated with historic capacity factors through 2050,  
9 Witness Fitch then applies an arbitrary carbon cap, which is modeled as a straight-line  
10 emissions trajectory from 2020 to zero carbon emissions in 2050. The analysis deems a  
11 fossil unit "stranded" and "pulled out of operation" when the assumed emissions of that  
12 unit causes the fleet to exceed the imaginary carbon cap in any year. There are several  
13 issues with this approach. To begin with, the straight-line declining carbon cap as a forcing  
14 function for retirements or stranding is an artifice. Regulatory programs for emissions  
15 reduction, including the successful trading programs for sulfur dioxide and nitrogen oxides,  
16 include mechanisms for alternative compliance approaches, as these programs recognize  
17 that the operation of any one unit or the total emissions from the generating fleet can vary  
18 year to year. Emissions reductions tend to be "lumpy" as higher emitting units are retired,  
19 environmental controls are installed, or changes are made to operations. This causes large  
20 reductions in emissions reductions to occur in some years, while in other years emissions  
21 may be flat. A hard cap that forces units offline, as Witness Fitch has assumed, is neither  
22 realistic nor practicable. Further, Witness Fitch models a standard of zero emissions in  
23 2050, rather than net zero emissions consistent with Duke Energy's climate goals, federal



policy proposals and North Carolina's Clean Energy Plan. This assumption by design means all emitting generation is modeled as stranded in 2050 if not sooner. By imposing this carbon cap, assuming units go offline when the emissions cap is exceeded in any year, Witness Fitch ignores the engineering realities in the generation and delivery of electricity, including adjustments to dispatch, replacement of higher emitting resources with lower or zero emitting resources, and the necessity of serving customer demand. To grossly inflate his estimates of stranded costs, presumably for shock value, Witness Fitch calculates these stranded costs through 2075, using a 40-year book life for fossil assets. Because his analysis is riddled with simplistic and unrealistic assumptions, I believe the Commission should not give any weight to the ETI report.

**Q. ARE THE CLAIMS BY WITNESS FITCH AGAINST ANY NEW NATURAL GAS GENERATION WIDELY EMBRACED BY OTHER MODELING EFFORTS?**

A. No. Other modeling efforts by well-established and respected organizations, including the National Renewable Energy Laboratory ("NREL") Carbon-Free Resource Integration Study<sup>19</sup> and the Princeton University Net-Zero America research<sup>20</sup> show a continued role for new natural gas capacity, even with carbon policy. As a brief overview, the NREL study examined the integration of carbon-free resources in the Carolinas to meet 70% by 2030, and net zero by 2050 carbon constraints. The study found new gas capacity in the policy case reflected the need for dispatchable resources to meet reserve margins. NREL is the premier federal laboratory researching renewable energy technology, publishing

<sup>19</sup> Sergi, B., B. Hodge, D. Steinberg, G. Brinkman, S. Haase, M. Emmanuel, and O. Fernandez. Duke Energy Carbon-Free Resource Integration Study: Capacity Expansion Findings and Production Cost Modeling Plan. NREL/PR-5D00-78386. NREL, Nov. 10, 2020.

<sup>20</sup> E. Larson, C. Greig, J. Jenkins, E. Mayfield, A. Pascale, C. Zhang, J. Drossman, R. Williams, S. Pacala, R. Socolow, EJ Baik, R. Birdsey, R. Duke, R. Jones, B. Haley, E. Leslie, K. Paustian, and A. Swan, Net-Zero America: Potential Pathways, Infrastructure, and Impacts, interim report, Princeton University, Princeton, NJ, December 15, 2020.

1 more than 2,000 scientific and technical materials in 2020 alone. The Princeton University  
2 modeling, conducted by researchers at the Andlinger Center for Energy and the  
3 Environment, showed that to ensure reliability, all policy scenarios retained firm generating  
4 capacity through 2050. The model favored gas plants with declining utilization rates and  
5 burning an increasing blend of hydrogen for firm capacity to meet an ambitious 2050  
6 carbon target. Other studies have reached similar conclusions on the evolving, but critical  
7 role of dispatchable gas capacity in decarbonization efforts.<sup>21</sup> In North Carolina, modeling  
8 for the Clean Energy Plan performed by the consultant ICF looked at a range of climate  
9 policies and combination of policies showed continued selection of new natural gas  
10 capacity and importantly continued operation of these units through 2050.

11 Another deficiency in Witness Fitch's testimony is the claim that renewable  
12 technologies outcompete fossil generation on a levelized cost of energy basis ("LCOE") as  
13 justification that natural gas plants are not needed.<sup>22</sup> Such LCOE comparisons only  
14 consider the cost of renewables but leave out the vital consideration of dependable capacity  
15 required to backup renewables, such as energy storage or dispatchable gas generation, to  
16 cover the situations when renewables aren't producing, as highlighted by the NREL and  
17 Princeton studies. This aspect is covered more extensively by DEC/DEP Witness Snider.

18 **Q. HOW ARE THE COMPANIES ADDRESSING CLIMATE RISK?**

19 A. Duke Energy is a national leader for carbon emissions reduction in the electric sector,  
20 having already reduced emissions by more than 50% in DEC/DEP since 2005. Electricity

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<sup>21</sup> For example, see: Energy+Environmental Economics and Energy Futures Initiative. Net-Zero New England: Ensuring Electric Reliability in a Low-Carbon Future. Nov. 2020; Energy Futures Initiative. Pathways for Deep Decarbonization in California. May 2019.

<sup>22</sup> Vote Solar Fitch Direct, Exhibit TF-2, at 18-19.

1 generation by DEC and DEP in the Carolinas is already 60% carbon-free, and 100% free  
2 in South Carolina since DEC and DEP have no operating coal plants remaining in the state.  
3 North Carolina is third in the U.S. for installed utility-scale solar capacity and South  
4 Carolina is a leader for customer-sited solar such as rooftop solar.

5 Duke Energy has been actively addressing climate risks for over a decade, and was  
6 one of the first utilities to establish carbon goals, dating back to 2010. Since that time,  
7 Duke Energy has periodically updated its goals to reflect technology advancements and  
8 cost changes, with the most recent climate goals of 50% by 2030 and net zero by 2050  
9 announced in September 2019. Annually, Duke Energy's Sustainability Report  
10 benchmarks the progress in reducing emissions of carbon dioxide, sulfur dioxide, nitrogen  
11 oxides and other greenhouse gases, but also provides information on how Duke Energy is  
12 holistically addressing environmental performance.

13 Duke Energy performs a comprehensive Enterprise Risk Assessment ("ERA") on  
14 an annual basis to identify potential major/substantive risks to its operations and value,  
15 including climate-related risks. This process is managed by the Enterprise Risk  
16 Management ("ERM") function, which maintains and develops policies and standards and  
17 supports risk assessments across the enterprise. Climate change risks, including physical,  
18 policy and financial risks are reflected in the ERM process. Duke Energy continuously  
19 monitors the status of transition risks due to emerging climate change-related legislation  
20 and regulations. Duke Energy's 2020 Climate Report includes a section on Policy Risk  
21 that discusses potential climate policies and the principles under which Duke Energy  
22 assesses such potential policies.

1 **Q. DO THE COMPANIES' IRPs PORTRAY A CONTINUATION TO THE**  
2 **COMPANIES' COMMITMENT TO CLEAN ENERGY?**

3 A. Yes. The Companies' IRPs six resource portfolios encompass a range of scenarios, with  
4 varied dependency on policy and technology development. Consistent with the Duke  
5 Energy's climate goals, the Companies' IRPs give a clear line of sight to at least 50%  
6 reduction in carbon emissions below 2005 levels by 2030. Notably, each of the portfolios  
7 achieve emissions reductions well above 50% by 2030.

8 Duke Energy's Climate Report also clearly shows that we can meet the net zero by  
9 2050 goal while retaining natural gas capacity on the system for reliability, making it used  
10 and useful. As noted previously, by 2050, natural gas will account for about 6% of  
11 generation. New gas units would be hydrogen-capable, and could provide dispatchable  
12 carbon-free power once green hydrogen technology reaches commercial maturity. Because  
13 the timeframe for technology maturation is outside of the 15-year planning horizon in the  
14 IRPs, the Companies included discussion of hydrogen as a possible future option.

15 The Companies will continue to monitor technology development and costs, and  
16 include these options as appropriate in future IRPs—and the next one will be filed in less  
17 than a year and half from the Commission's decision in these cases. There are also several  
18 strategies the Companies can employ to further mitigate the risk of stranded assets,  
19 including modeling gas assets with a shorter book life (25 years, compared to 40 years used  
20 in the ETI report) to ensure they still make economic sense for customers. Importantly,  
21 the Companies have considered a range of energy policies that could affect the resource  
22 mix in the 2020 IRPs. These IRPs present a variety of generation portfolios, with their  
23 estimated costs, that seek to retire coal faster and add more solar and storage. While

1 intervenors have their own views of what the Companies' IRPs should include and are  
 2 based on biased viewpoints that promote the resources they are vested in, it is important to  
 3 remember that the Companies' portfolios were developed using stakeholder feedback,  
 4 including from Vote Solar and CCEBA. As a result, the IRPs contemplate a variety of  
 5 future scenarios, including portfolios to achieve 70% carbon reduction by 2030 and a no  
 6 new gas portfolio. This examination of multiple portfolios with varied carbon reductions  
 7 is prudent and meets the requirements of Act 62.

8 **Q. IS WITNESS FITCH CORRECT ABOUT DUKE ENERGY'S CLIMATE RISK**  
 9 **DISCLOSURES?**

10 A. No. Witness Fitch claims that Duke Energy has not adequately addressed costs associated  
 11 with climate risk, citing the Duke Energy's CDP disclosures did not include an estimation  
 12 of social or externality costs.<sup>23</sup> This is deliberately misleading. The CDP does not ask for,  
 13 nor request, anything other than potential costs that would be incurred directly by the  
 14 Companies due to risks from climate change. For example, CDP's Reporting Guidance  
 15 for question C2.3a provides the direction "[f]or the purposes of this response, the risks  
 16 reported should only be those which may pose inherently substantive impacts in your  
 17 business operations, revenue, or expenditure, regardless of whether or not the company has  
 18 taken action to mitigate the risk(s)."<sup>24</sup> For the sub-question regarding magnitude of risks,  
 19 the guidance instructs that "[t]he magnitude describes the extent to which the impact, if it  
 20 occurred, would affect your business."<sup>25</sup> Duke Energy has been transparent in the

<sup>23</sup> Vote Solar Fitch Direct, at 7-8. CDP, formerly the Carbon Disclosure Project, is an international non-profit organization that assists companies and cities disclose their environmental impact.

<sup>24</sup> CDP Climate Change 2020 Reporting Guidance. Accessed from:  
<https://guidance.cdp.net/en/guidance?cid=13&ctype=theme&idtype=ThemeID&incchild=1&microsite=0&otype=Guidance&page=1&tags=TAG-646,TAG-605,TAG-600>.

<sup>25</sup> *Id.* (emphasis added).

1 disclosure of climate risks on the business, and has appropriately addressed these risks in  
2 the Climate Report.

3 **Q. DO YOU AGREE WITH INTERVENOR RECOMMENDATIONS THAT THE**  
4 **COMMISSION SHOULD REQUIRE THE STUDY OF WHOLESALE MARKET**  
5 **STRUCTURES IN THE IRPs?**

6 A. No. Witness Fitch and Witness Lucas both make such a recommendation. I believe that it  
7 would be inappropriate for the Commission to force a study of an energy imbalance market  
8 or regional transmission organization (“RTO”) in the context of an IRP proceeding—the  
9 Commission should not force a study of measures that it is not legally empowered to enact.  
10 I’m not a lawyer, but it’s my understanding that any movement to an RTO would require  
11 the involvement of the Federal Energy Regulatory Commission as well as the NCUC.  
12 Resource planning— modeling and planning how the Companies will meet their load  
13 obligations for the next 15 years—needs to be rooted in the regulatory and wholesale  
14 market structures in place at the time the IRP is created. More importantly, intervenors ask  
15 this Commission to make policy decisions that are within the authority of the South  
16 Carolina General Assembly. Any study of new wholesale market structures should be  
17 conducted pursuant to the legislatively-approved process in South Carolina and within the  
18 framework intended by legislators in South Carolina. While the Commission would  
19 undoubtedly have much work to do if the State of South Carolina mandates the significant  
20 decision to transition to a different market structure, that involvement would only occur  
21 after the state legislators complete their study and decide to move in that direction. The  
22 South Carolina General Assembly has clearly stated and affirmed in its passage of Act 187

1 that study of an any future changes in the electricity market structures in South Carolina  
2 shall originate in a legislative study committee.<sup>26</sup>

3 Passed on September 23, 2020, Act 187 established an eight-member “Market  
4 Reform Study Committee” and provided the Market Reform Study Committee with very  
5 specific guidelines regarding what, when, and how they were to undertake their work. For  
6 example, Act 187 identified at least ten specific areas for potential study by the legislative  
7 committee, including establishing a South Carolina RTO or an RTO including South  
8 Carolina and other Southeastern states, joining an existing RTO, establishing an energy  
9 imbalance market, measures to accelerate reductions in emissions associated with South  
10 Carolina’s electricity supply, establishing joint dispatch agreements among state or  
11 regional utilities, or other potentially beneficial regulatory framework changes. Act 187  
12 further specified how the legislator-led committee shall conduct the study:

13 At a minimum, the study shall address the following issues:

14  
15 (1) the legal and procedural requirements associated with adoption of any  
16 recommended electricity market reform measures, including identification  
17 of existing laws, regulations, and policies that may need to be amended in  
18 order to implement the electricity market reform measures;

19  
20 (2) the potential costs and benefits to South Carolina electric consumers and  
21 ratepayers of each electricity market reform measure studied based on  
22 factors including, but not limited to: generation production cost savings,  
23 fuel savings, transmission cost savings, battery storage, reliability,  
24 resiliency, generation resource diversity, generator availability, the  
25 promotion and integration of demand response and energy efficiency,  
26 deployment of renewable resources, deferral of capital investments, the  
27 effect on economic development and retention of industry, stranded costs  
28 and regulatory mechanisms to mitigate any stranded costs, and the long-  
29 term impact on consumer rates and service quality in the short and long  
30 term; and  
31

<sup>26</sup> Act 187 of 2020, *available at* [https://www.scstatehouse.gov/sess123\\_2019-2020/bills/4940.htm](https://www.scstatehouse.gov/sess123_2019-2020/bills/4940.htm).

1 (3) the experience of other states with adopting each electricity market  
2 reform measure studied.<sup>27</sup>

3 Moreover, it is clear the that the General Assembly did not intend for electric customers to  
4 pay for an RTO study as it designated general funds for such purpose.

5 **Q. DO YOU HAVE ANY OTHER CONCERNS ABOUT THE RECOMMENDATIONS**  
6 **OF WITNESSES FITCH AND LUCAS?**

7 A. It is my belief that the Companies will never file IRPs that please every party. I have  
8 worked in the policy arena for over two decades, and there are diverse stakeholder  
9 viewpoints, some of which will never agree. As hard as we try to get all stakeholders at  
10 the table and find alignment, everyone will usually want a little more to suit the goals of  
11 the organization they represent. If every interested party had every bit of analysis they  
12 wished for, our IRPs would span multiple decades, cost millions of dollars, and there would  
13 likely be little change to what is needed for reliability, diversity of supply, and customer  
14 affordability – the keystones of Act 62 as I read it. I understand our IRPs to be as robust  
15 as any in the country and we file them more frequently than the law requires. The  
16 Companies' 2020 IRPs involved significant opportunities for meaningful stakeholder  
17 involvement and input. In my view, the Companies have incorporated much of that  
18 feedback and tried to be as responsive as possible while ensuring we meet our regulatory  
19 and statutory obligations. I believe requests for more analysis and more scenarios should  
20 be tempered by the benefit they would actually bring to this process and to customers.

21 **Q. DOES THIS CONCLUDE YOUR REBUTTAL TESTIMONY?**

22 A. Yes.

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<sup>27</sup> *Id.*